



May 4, 2003

Office for the General Counsel for Ocean Services  
National Oceanic and Atmospheric Administration  
U.S. Department of Commerce  
1305 East-West Highway  
Silver Spring, MD 20910

Dear Office for the General Counsel for Ocean Services,

Please continue to uphold the Connecticut Department of Environmental Protection's denial of permits to Islander East to build a Cross-Sound (Long Island Sound) pipeline. This pipeline would destroy thousands of acres of the Sound's fragile seafloor.

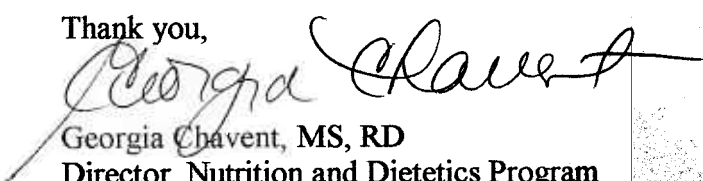
Environmental and consumers groups have worked diligently during the past 10 to 20 years to try to bring the Sound back to its previous glory (at one time, New Haven's oyster beds were the finest in the world) and it would be a terrible environmental disaster to allow a pipeline of this nature to be built.

The necessity for such a pipeline is hotly debated here in Connecticut with most residents, including our legislators (Senators Dodd and Lieberman and our five representatives) opposing the possible action by Islander East.

Please continue to uphold the action by our state Department of Environmental Protection, as well as, the U.S. Army Corps of Engineers.

Help us Save Our Sound!

Thank you,

  
Georgia Chavent, MS, RD  
Director, Nutrition and Dietetics Program  
Resident of Woodbridge, CT

203- 932-7410  
gchavent@newhaven.edu

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# TOWN OF NORTH BRANFORD

TOWN HALL P.O. BOX 287 NORTH BRANFORD, CONNECTICUT 06471-0287  
TOWN MANAGER (203) 315-6000 TOWN HALL FAX (203) 315-6025

May 6, 2003

Donald Evans, Secretary of Commerce  
C/o Office of the General Counsel for Ocean Services  
National Oceanic and Atmospheric Administration  
U.S. Department of Commerce  
1305 East-West Highway  
Silver Spring, MD 20910

Honorable Secretary Evans:

The Town of North Branford, Connecticut has already expressed its opposition to the appeal submitted by Islander East, L.L.C. to your agency after the Connecticut Department of Environmental Protection (CTDEP) found the project to be inconsistent with the federally-approved Coastal Zone Management Program (see letter dated December 2, 2002).

Further, we have asked your agency to follow the lead set by the U.S. Army Corps of Engineers in expanding its traditional scope and is examining upland tributaries, wetlands and watercourses in addition to Long Island Sound. We believe the expansion of your examination will assist the regulatory process as it has already been noted by the United States Environmental Protection Agency, in a correspondence dated September 30, 2002, that the Final Environmental Impact Statement issued by FERC "lacks the detailed information necessary to understand the direct, indirect and secondary impacts to the wetlands and waters of the United States associated with the proposed project."

Of note, one of those secondary impacts exists in North Branford. We have noted for both your agency and the Federal Energy Regulatory Commission that the Islander East Pipeline is proposed to cross and disturb an area of pre-existing, groundwater contamination with the presence of a tetrachloroethylene (PCE) pollution plume.

From the Town's perspective a comprehensive evaluation on the localized, groundwater contamination in the direct path of the pipeline should have been a piece of fundamental scientific data, quite germane to the decision-making process before your agency in assessing the project's impacts to Long Island Sound. As previously recorded (FERC document #2276640), and submitted for your consideration, Rizzo Associates has documented for the Connecticut Department of Environmental Protection that the bedrock in the pipeline's North Branford path was described as fractured and complex in nature. As a result, Rizzo advised the Department of Environmental Protection against further disturbance or testing to prevent a spread in the



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pollution plume. This same document discusses the impracticability of remediating the presence of PCE in the same area proposed for the pipeline.

As Islander East did not complete a proper environmental assessment of the existing PCE plume to this point, no tool exists for the parties to reach a valid conclusion regarding the potential for subsurface spread of the existing PCE plume and the high potential contamination of potable water sources and Cedar Pond.

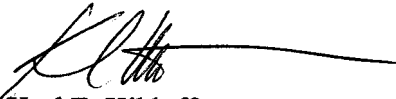
Beyond local impacts to potable water in the pipeline's route, should the PCE pollution plume spread as a result of Islander East's activities, contamination will spread beyond North Branford. Cedar Pond is an upland tributary to Long Island Sound. PCE pollution could reach Long Island Sound through both the Branford River and Lake Saltonstall, a public drinking supply reservoir, which ultimately discharge directly into the Sound.

It is our hope that your agency will give due consideration to the submitted report by Rizzo Associates for the CTDEP and the potential that the Islander East Pipeline project presents for pollution to upland tributaries of Long Island Sound.

We strongly oppose the construction and installation of the Islander East Pipeline and accordingly, urge you to deny Islander East's appeal in the matter before you.

Thank you for your consideration.

Sincerely,

A handwritten signature in black ink, appearing to read 'K. Kilduff', followed by a long horizontal line extending to the right.

Karl F. Kilduff  
Town Manager

attachment



**STATE OF CONNECTICUT**  
**DEPARTMENT OF ENVIRONMENTAL PROTECTION**



October 22, 2001

Gina Revezzi  
P.O. Box 888  
1289 Foxon Road  
North Branford, CT 06471

Dear Ms. Revezzi:

Per your request, I am forwarding a copy of the report entitled: Technical Impracticability of groundwater Remediation Pursuant to Connecticut General Statutes 22a-133k-3(e)(2) Presence of DNAPL and Technical impracticability of Removing or Containing DNAPLs 1209-1213 Foxon Road North Branford, Connecticut. The report was prepared by Rizzo Associates and submitted to the DEP on behalf of SEBMAP Realty, LLC on March 30, 2001.

This report describes in detail the hydrogeological setting of the area, and a summary of groundwater investigations. Based on these investigations, the data indicates that a tetrachloroethene (PCE) plume exists in the bedrock aquifer underlying your property.

It is my understanding that you have become aware of a proposal to install a natural gas pipe line on your property which may require blasting into the bedrock as part of the installation. It should be noted that any blasting that occurs within the area of the contamination plume can have a direct effect on the contaminant migration in the bedrock aquifer.

Therefore, it appears that an Environmental Impact Study would be warranted prior to any blasting in the area. Please feel free to forward my name and phone number to anyone associated with this project that may wish to discuss this issue with me.

If you have any questions regarding this matter, please feel free to contact me at (860) 424-3785.

Sincerely,

A handwritten signature in cursive script, reading "Jonathan P. Goldman".

Jonathan P. Goldman  
Environmental Analyst  
Potable Water Program

enclosure

cc: Elsie Patton, Assistant Director, PERD/DEP

**RIZZO**  
**ASSOCIATES**

A TETRA TECH COMPANY

150 Trumbull Street, 4th Floor  
Hartford, CT 06103  
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[www.rizzo.com](http://www.rizzo.com)

March 30, 2001

Mr. Raymond Frigon  
Department of Environmental Protection  
79 Elm Street  
Hartford, CT 06106

**Re: Technical Impracticability of Groundwater Remediation Pursuant to  
Connecticut General Statutes 22a-133k-3(e)(2)  
Presence of DNAPL and Technical Impracticability of Removing or  
Containing DNAPLs  
1209-1213 Foxon Road  
North Branford, Connecticut**

Dear Mr. Frigon:

This application for a Technical Impracticability Variance was developed based on the results of past investigations conducted at the property located at 1209-1213 Foxon Road in North Branford, Connecticut (the Site) and the properties downgradient from the Site. Investigations conducted on downgradient properties include the assessment of area-wide groundwater contamination conducted by the DEP and sampling of local wells conducted by the East Shore District Health Department.

The evaluation of Site specific data utilizing EPA and DEP guidance documents supports the presence of DNAPL on the Site. Physical or hydraulic containment of DNAPL would not be effective controls given the fractured bedrock setting and extent of contamination. Municipal water would be provided to residences within the area impacted by the PCE plume. A risk assessment evaluating the use of groundwater for irrigation at the Rivezzi Garden Center was completed in December 2000 and amended in January 2001.

### **Summary of Previous LBG Investigation**

LBG conducted an investigation in February 1995, which focused on areas of known or suspected storage and handling of dry cleaning solvents and associated by-products. LBG installed twelve soil borings and five monitoring wells on the Site in an effort to define the nature and extent of volatile organic contamination. Twenty-one soil samples and six

Mr. Raymond Frigon  
March 30, 2001  
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groundwater samples were submitted for laboratory analysis. A groundwater elevation survey was conducted on three dates to determine the direction of groundwater flow at the Site.

The septic tanks were sampled and analyzed for VOCs. No VOCs were detected in the septic tank sludges. Groundwater from the five newly installed on-site monitoring wells was sampled, along with the on-site supply well. No VOCs were detected in the monitoring wells, except MW-5, which exhibited 30,000 parts per billion (ppb) of PCE. MW-5 is located immediately east of the former dry cleaner's location in the Site building. No other VOC constituents were detected in MW-5.

Petroleum constituents (ethylbenzene, toluene, and xylene) were detected in the on-site supply well. This well is located on the west side of the property, and the source of the petroleum constituents is likely the historic release of gasoline from the nearby Pascale's Garage. The concentrations of petroleum constituents are below federal MCLs and Connecticut Action Levels.

Numerous soil samples were submitted for analyses of VOCs. PCE was detected in soils along the east wall of the Site building, with the maximum concentrations (9,900 ppb) identified in test boring TB-1 at a depth of 34 to 36 feet below the ground surface. Other soil samples collected from this area exhibited 52 to 320 ppb of PCE. No other VOCs were detected in Site soils.

LBG concluded that the distribution of PCE is consistent with a former filter powder pile as the source for soil and groundwater contamination alleged to have been on the Site. Considering the localized flooding and overflows from the septic tank, LBG determined the distribution of PCE in soil and groundwater was consistent with the filter powder as the source.

The observed groundwater flow direction was different than the anticipated groundwater flow. LBG had assumed the direction of groundwater flow would have been to the southeast or east. However, the observed groundwater flow over the Site is to the north and northeast. LBG attributes the groundwater flow direction to the orientation of the bedrock fractures and/or the stresses placed on the bedrock aquifer by the on-site supply well.

LBG recommended the soils east of the Site building be remediated using a soil vapor extraction technique. LBG anticipated that a focused groundwater remediation program might be appropriate to limit the off-site migration of groundwater containing high concentrations of PCE ( $\pm 30,000$  ppb). However, further definition of the groundwater flow regime and delineation of the nature and extent of contamination was recommended prior to formulating the remediation plan.

## Presence of DNAPL

The following information is provided to estimate the likelihood of dense non-aqueous phase liquids (DNAPLs) and to evaluate the technical impracticability of groundwater restoration at the Site.

An evaluation of the potential presence of DNAPLs at the Site, based on existing data, was developed using Publication 9355.4-13, issued in September 1993 by the U.S. Environmental Protection Agency's (EPA) Office of Solid Waste and Emergency Response, *Evaluation of the Likelihood of DNAPL Presence at NPL Sites*. Using the guidance outlined in this document relative to Site conditions, the potential for DNAPLs at the Site is categorized as moderate to high. However, Site specific conditions, as discussed below, indicate a high likelihood for the presence of DNAPLs.

**Site Use.** A commercial dry cleaning facility operated on the Site from 1967 to 1978. This industry is considered to have a high probability of historic DNAPL release.

**Nature of Release.** The cause and nature of the release have not been determined. Previous studies have investigated areas outside the building such as storage tanks and septic systems where a catastrophic release would be most likely to occur. The volume of the release, which equals the soluble phase, is estimated to range between 1 to 7 gallons (2.8 to 28 liters) of solvent, based on the concentrations of PCE detected in groundwater between the Site and Cedar Lake. It is not possible to estimate the quantity of PCE that may exist as DNAPL in the vicinity of the Site. These factors indicate greater difficulty in achieving remedial objectives.

**Site Characterization.** Concentrations of DNAPL-related compounds that measure greater than 1% of the effective solubility indicate a moderate potential for the presence of DNAPLs. Tetrachloroethene (PCE) has been detected in groundwater at a concentration of 30,000 micrograms per liter ( $\mu\text{g/L}$ ). Based on an estimated solubility for PCE of 150,000  $\mu\text{g/L}$ , this concentration equals 20% of the solubility or 20 times the minimum amount indicative of potential DNAPLs. This finding supports a very high probability of DNAPLs being present at the Site.

## Complexity of Subsurface Characteristics of the Site

The subsurface characteristics of the Site and the properties of PCE complicate decontamination efforts, regardless of the technology chosen. These properties make finding the contaminant sources difficult, increase contaminant spreading and cause concentration in zones in which contaminants are difficult or impossible to extract with present technology. Overburden materials

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overlying bedrock are composed primarily of sands. Overburden thickness varies from approximately 10 to 40 feet. A bedrock trough trending west to east exists on the northern portion of the site as shown on Figure 1. A cross section of the Site is shown on Figure 2. The regional bedrock scenario is also quite complex. There is a major fault zone running southwest to northeast through the Site area. Bedrock to the west of the fault is the Shuttle Meadow Formation, a silty shale. To the east of the fault lies the Collins Hill Formation; a medium to coarse grained schist. A basalt ridge exists immediately north of the Site. Groundwater occurrence is below the bedrock surface, except for the overburden immediately above the bottom of the trough. The hydraulic capacity of the bedrock aquifer would not be sufficient to influence areas where DNAPL is present.

## **DNAPL Removal and Containment Technically Impracticable**

The evaluation of remedial alternatives considered costs relative to social and environmental benefits. Due to the limited hydraulic conductivity of fractured bedrock, the DNAPLs cannot be contained either physically or hydraulically in accordance with RCRA 22a-133k-2(g). The migration of DNAPL in the bedrock cannot be prudently contained or controlled.

The following discusses the ability of current technologies to contain DNAPL in this bedrock setting.

## **Evaluation of Remedial Alternatives**

Several alternatives to containing the DNAPL contamination in the bedrock aquifer and overburden soils have been considered for the Site. The objective is to evaluate whether technically and financially feasible remediation technologies exist that can be expected to achieve remedial goals with a reasonable degree of certainty. Consideration has been given to establish containment technologies considering cost. However, because of the contaminant and subsurface conditions present on the Site, only source removal of PCE in overburden soils is proposed as the remedial measure.

The chances for success for further investigation and remediation of groundwater beneath the bedrock is considered to be low relative to the inordinate expenses anticipated for completing these actions. Costs for containment alone of contaminated groundwater using pump and treat technology is presented below to illustrate this point. However, containment using hydraulic controls is not considered to be effective considering the bedrock regime.



In general, the combination of the contaminant and subsurface conditions at the Site and the limitations of the identified remediation technologies have shown that established containment remediation technologies identified during this review are not capable of achieving objectives within the foreseeable future.

## Contaminant Distribution

**Contaminant Phase.** Investigations conducted to date have not fully characterized the contaminant phases present at the Site. PCE has been detected in the dissolved phase in groundwater and in the adsorbed phase in overburden soils. Dissolved phase contamination in bedrock, with the likely existence of DNAPLs, represents one of the most difficult remedial scenarios. DNAPL has likely migrated off-site, further exasperating the ability to contain the contamination with current technologies. Due to the proximity of the building to the release and the downgradient property boundary, further investigation of potential source areas would be difficult and costly.

**Contaminant Depth.** The vertical extent of PCE occurrence has not been evaluated. PCE has been detected in groundwater at approximately 50 feet below grade. This depth would not be an impediment to conducting containment activities. The high specific gravity of PCE and the dipping bedrock fractures present at the Site represent favorable conditions for significant vertical and lateral migration of DNAPL.

## Geology

**Stratigraphy.** The stratigraphy of the Site consists primarily of a sandy overburden overlying a trough-shaped bedrock surface. Contaminants have been detected in both media, resulting in an overall complex remediation scenario. DNAPLs may be present in hydraulically isolated areas in the fractured bedrock, limiting the ability to access and recover from these areas.

The Site is in the immediate proximity of a major northeast/southwest trending fault that separates the Shuttle Meadow Formation Shale to the northwest from the Collins Hill Formation (schist) to the southeast. The Holyoke Basin Formation (basalt) lies immediately north of an east west trending fault north of the Site. The associated jointing and fracturing provides a medium for migration of DNAPL into locations where little or no interconnectedness to the prevailing joint and fracture patterns exist in the area.

**Degree of Interconnectedness.** Overburden deposits are relatively homogeneous sands, and should be amenable to conventional technologies. Fractured bedrock media at the Site represents a lack of interconnectedness with a high degree of remediation difficulty.

## Hydraulics/Flow

**Hydraulic Conductivity.** Hydraulic conductivity values for the Site have not been determined. Hydraulic conductivity in the overburden soils are expected to be moderately high, potentially ranging from 10<sup>-3</sup> to 10<sup>-1</sup> centimeters per second (cm/sec). Hydraulic conductivity in fractured bedrock is expected to be low, potentially ranging from 10<sup>-6</sup> to 10<sup>-2</sup> cm/sec. More importantly, due to the nature of the bedrock, the presence of the faults and associated fractures, the interconnectedness of the bedrock fractures is likely limited. This would not likely be reflected in the determination of hydraulic conductivity.

**Vertical Flow.** Vertical flow has not been investigated. Aquifers with a large downward flow component are considered difficult to remediate. Bedrock fractures have been mapped as dipping 15° north, and would represent a pathway for vertical migration.

**Limited Effectiveness of Pump and Treat System for Hydraulic Containment in Bedrock Aquifer.** The implementation of a pump and treat system for the bedrock aquifer could provide a mechanism for containment of the PCE plume. Design of a pumping system that is hydraulically connected to all potential areas of DNAPL occurrence in the fractured bedrock would be difficult to impossible. Hydraulic containment by pump and treat would not be prudent considering costs in light of social and environmental benefit. The environmental benefits are considered low relative to the limited potential resource of the bedrock aquifer.

The cost to implement this alternative depends on the aquifer characteristics (not yet evaluated), the extent of the plume off-site (not fully defined), and the number of wells and makeup of the treatment system needed to successfully address the contamination. The estimated cost for additional investigation may range from \$30,000 to \$80,000. The estimated capital costs for a one to three recovery well system may range from \$75,000 to \$150,000, with annual monitoring and maintenance costs in the range of \$60,000 to \$120,000. The costs of the system and operation are expected to exceed \$1,000,000 in the initial 7 to 10 years of operations. The system would likely operate for >10 years and is not expected to achieve the ARARs within reasonable timeframes (decades) despite substantial effort and cost.

Due to the nature of the fractured bedrock, hydraulic containment of DNAPL would likely have limited effectiveness and may not be technically feasible.

**Limited Effectiveness of Physical Containment in Bedrock Aquifer.** Physical barriers such as sheet piling or slurry walls would also require hydraulic controls and would not be effective in sealing off the bedrock. These types of containment systems can be useful in overburden, but cannot be installed in consolidated bedrock. Because of the unknown nature of the bedrock fractures and vertical contaminant distribution, it is unlikely that a physical containment system could be designed to effectively prevent the further migration of contaminants.

## **Risk Assessment**

A Risk Assessment was conducted to evaluate the use of groundwater containing PCE for irrigation at the Rivezzi Garden Center. The risk assessment did not include the evaluation of potential exposures in other downgradient scenarios since the depth to groundwater is greater than 15 feet below the ground surface in the vicinity of the site and downgradient properties within the plume are either currently connected or will be connected to public water. The risk assessment approach was developed in consultation with Dr. Gary Ginsberg of the Department of Public Health. Potential migration pathways and related concerns are discussed below.

Based on available information, it is not known if soils under the Site building represent a potential risk. Evaluation of soils beneath the building through the completion of a soil gas survey would determine if further investigation might be warranted.

**Vapor Exposure.** The depth to water in impacted areas is expected to be greater than 15 feet. In areas where depth to groundwater is less than 15 feet, concentrations of PCE are expected to be less than Residential Volatilization Criteria (1,500 µg/L). Inhalation of PCE was considered in the risk assessment for workers irrigating plants in the Rivezzi greenhouses.

**Dermal Contact/Ingestion.** Dermal contact and ingestion of irrigation water and receiving soils on the Rivezzi's property is a potential exposure pathway. Providing an alternate water supply may eliminate this risk. Treatment or no treatment of the current irrigation system water was also considered as possible alternatives. The risk assessment identified a theoretical unacceptable risk to workers performing irrigation in the Rivezzi Greenhouses.

## **Contaminant Distribution Relative to Surface-Water Protection Criteria**

Information concerning contaminant distributions in the vicinity of the Site were obtained from the East Shore District Health Department. PCE concentrations in the Site vicinity are shown on

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Figure 3. Based on this information, the Surface Water Protection Criteria of 88 µg/L has not been exceeded on property immediately upgradient of Cedar Lake.

## Conclusions and Recommendations

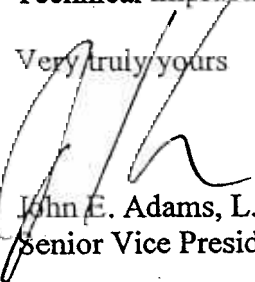
The data for the Site indicates that it is extremely likely that DNAPL is present at the Site. Due to the fractured nature of the bedrock, currently available technologies to contain DNAPL are not expected to be effective or reasonable. Further investigation of DNAPL is considered risky due to the potential for creating additional migration pathways. This area has limited potential for development as an aquifer resource due to low yield conditions present in the bedrock aquifer. It is likely that improvement to this limited resource may not be attained even with the implementation of extraordinary measures.

The NAPLs at this Site cannot be contained, either physically or hydraulically, or removed in accordance with R.C.S.A. 22a-133k-2 (g).

Since proven remediation technologies do not exist that are feasible for attaining drinking water standards at the Site within a foreseeable period of time, the recommended alternative is to investigate and remediate the source area to the extent feasible, and eliminate possible risks to potential sensitive receptors. An application to change the groundwater classification from GA to GB in the vicinity of the Site will be submitted to the DEP prior to May 1, 2001.

Based on the information presented in this application, we request the DEP approve this Technical Impracticability Variance pursuant to Connecticut General Statutes 22a-133k-3(e)(2).

Very truly yours



John E. Adams, L.E.P.  
Senior Vice President

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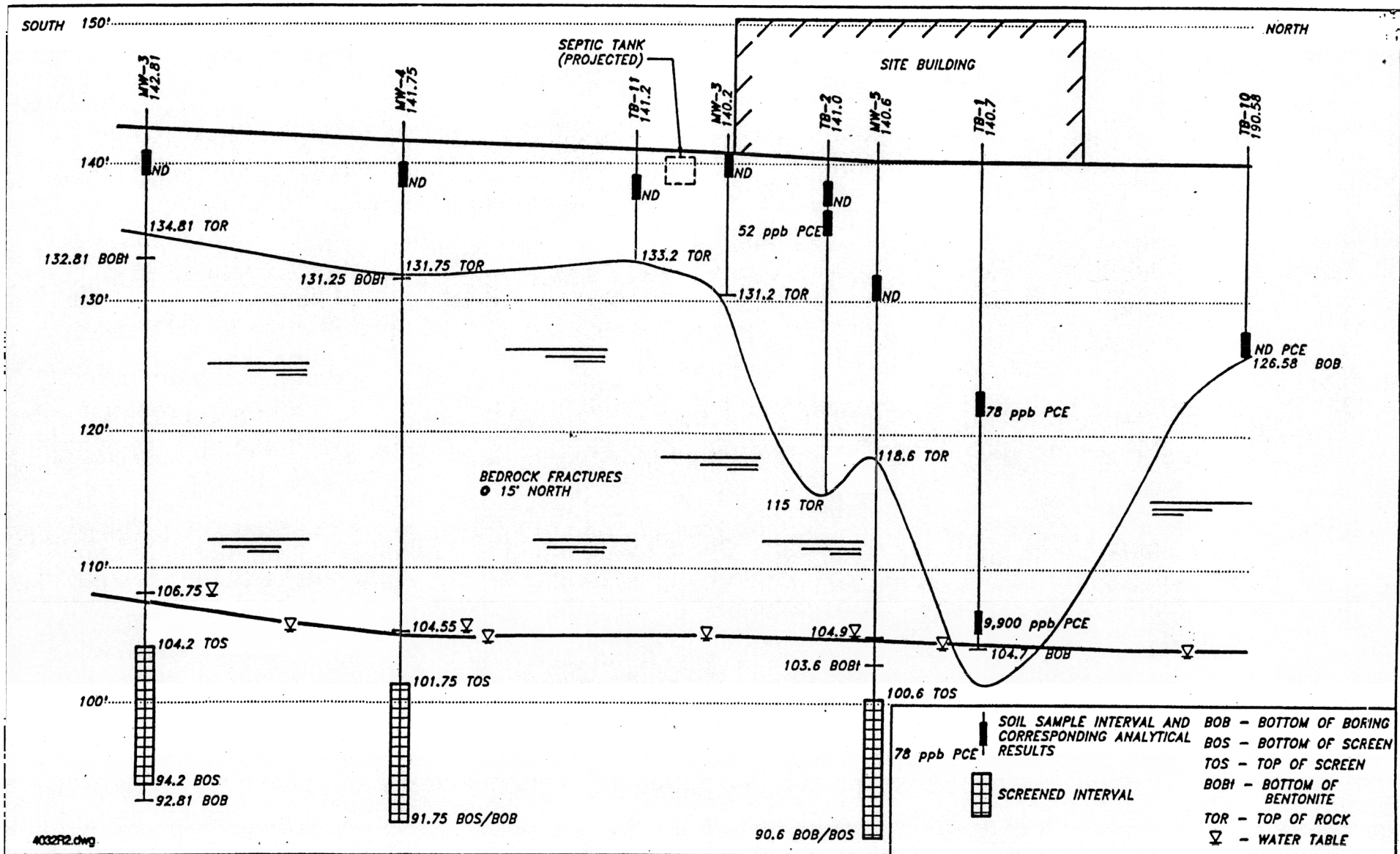
## References

Davis, A., Olsen, R. *Predicting the Fate and Transport of Organic Compounds in Water. Hazardous Materials Control.* May/August 1990.

LBG Engineering Services, Inc. *Subsurface Environmental Investigation, Hartt Property, 1209-1213 Foxon Road, North Branford, Connecticut.* February 1995.

Environmental Protection Agency. *Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration.* Publication 9234.2-25. September 1993.

Environmental Protection Agency. *Evaluation of the Likelihood of DNAPL Presence at NPL Sites.* Publication 9355.4-13. September 1993.



4032R2.dwg

0 VERTICAL 10 Feet  
0 HORIZONTAL 30 Feet

RIZZO ASSOCIATES, INC.

1209-1213 Foxon Road  
Project No. 4032.02  
North Branford, Connecticut

Cross Section - Showing  
Existing Wells &  
Soil Borings

Figure  
2